MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

MAX2053 – 3D SIMULATION

(All sections / Groups)

22 OCTOBER 2018
9.00 A.M - 11.00 A.M
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 11 pages of simulated questions. Read them carefully.

2. This exam paper consists of TWO parts:
   Part One: Multiple Choices — Answer **ALL 20** questions
   Part Two: Essay Questions — Answer **THREE** out of FOUR

3. Simulate all your answers in the Answer Booklet. May the force be with you.

PART ONE: MULTIPLE CHOICE QUESTIONS

Answer ALL Questions in the Multiple Choice Answer Sheet.

1. Which attribute below affects rigid body resistance against rotation forces in a rigid body simulation scene?

   A. Angular Friction
   B. Initial Forces
   C. Damping
   D. Dynamic Friction

2. Which attribute controls a dynamic field's drop-off area?

   A. Attenuation
   B. Magnitude
   C. Max Distance
   D. Speed

3. Keita wants to create particles automatically from collision points of rocks falling on a floor. What is the **BEST** tool for him to execute this effect?

   A. Use Particle Instancer with Collision editor
   B. Create an 'Emit from Object' particle emitter
   C. Create a particle emitter with the sprites wizard
   D. Use the Particle Collision Event editor

4. Below are statements regarding Paint Effects uses in MAYA. Which of following is **TRUE**?

   A. The Global Scale attribute is used to adjust the overall scale of the effect.
   B. Paint Effects is a particle based effects simulation
   C. MAYA Paint Effects can only be rendered using Maya Software.
   D. Paint Effects cannot be converted into Polygon

5. Donnatello wants to attach a new *ParticleShape* with an existing drag field. Which MAYA editor would she use to complete the task?

   A. Fields Connection Editor
   B. Dynamics Relationship Editor
   C. Dynamics Component Editor
   D. Dynamics Fields Editor

Continued .....

6. De Kaprioh created a rigid body totem and it is turning on the Y-axis. He wanted the totem to continuously spin without ever stopping. How can he achieve this using the rigid body dynamic systems?

   A. Assign a value to the Spin Impulse attribute
   B. Assign a value to the Rotate-Y attribute
   C. Decrease the angular damping attribute
   D. Increase the conserve value

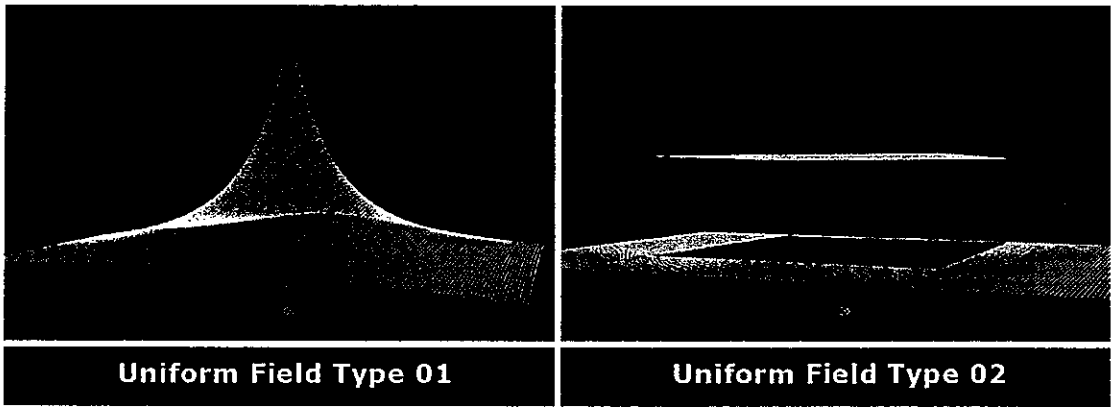

Image 01

7. *Image 01* shows two simulation results of a particle grid with a single uniform field (positive Y-axis direction) placed under it. Uniform Field Type 01 has a gradual fall-off result where else Uniform Field Type 02 has a distinctive cutoff. How would you achieve the effect similar to Uniform Field Type 02?

   A. Use the Volume Shape proxy option
   B. Turn on the Max Distance option
   C. Decrease the attenuation value
   D. Decrease the Fall-Off value to zero

8. Tom Keris used the '*Particle Instancer*' to execute a group of futuristic cars flying through the skies, but the cars are flying sideways. Which attribute does he need to change in order to achieve a proper effect?

   A. Aim Position > Change to World Velocity
   B. Rotation Type > Change to Velocity
   C. Aim Direction > Change to Velocity
   D. Aim Axis > Change to World Velocity

Continued .....

9. Milner wants to create a deformable ground using soft body dynamics. However the soft body floor does not stop deforming after collision. What can Milner do to better control the deformation result?

I. Decrease the conserve value
II. Decrease the friction value
III. Increase the resilience value
IV. Increase the damping value

A. I and II
B. I and IV
C. II and III
D. III and IV

10. Which of the following statements is **FALSE** regarding the 'Conserve' attribute?

I. Conserve allows the simulation system to retain all history of simulation fields that affected the object
II. Conserve allows an object to regain its speed without external fields affecting the object
III. Conserve does not affect simulated objects before a collision event
IV. A full conserve value does not allow objects to lose its internal forces when it is affected by fields

A. I, II and III
B. I, II and IV
C. II, III and IV
D. All of the above

11. Which statement below is **TRUE** regarding MAYA *Ocean* effects?

A. It creates full realistic 3D surface water deformation
B. It does not require real-time computer calculation to simulate
C. It can interact with MAYA fields and collision object
D. It is a flat NURBS surface with an *Ocean* shader

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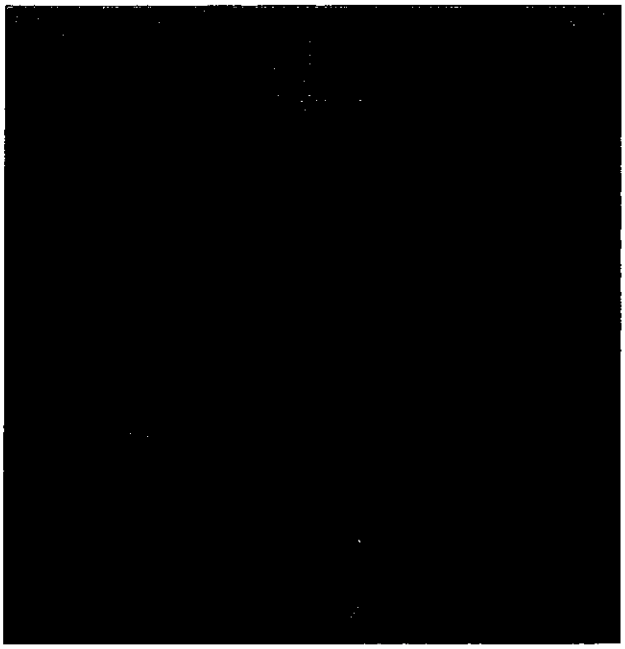

Image02

12. *Image 02* above shows an nCloth 3D plane constrained to a locator. Which nCloth constraint would be best to use to achieve this effect?

    A. Component Constraint
    B. Transform Constraint
    C. Point to Surface Constraint
    D. Location Constraint

13. Which options below can be used to control a particle's death?

    I. Add opacity > Opacity Per Object
    II. Emission Attribute > Max Count
    III. Lifespan Mode > Random Range
    IV. Per Particle Array > Lifespan PP

    A. I, II and III
    B. I, III and IV
    C. II, III and IV
    D. All of the above

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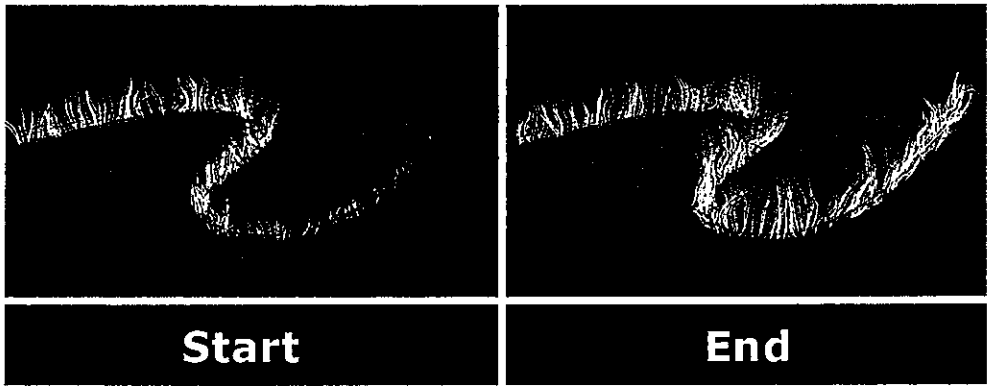

Image 03

14. *Image 03* above shows a Fire Paint Effects brush that is attached to a curve. The fire grows along the path from the start curve to the end curve as shown in the image. Which actions/options do you need to perform to mimic the result accordingly?

    A. Increase Flow Speed, Turn On Stroke Time, Turn On Time Clip
    B. Increase Flow Speed, Increase Surface Offset, Turn On Stroke Time
    C. Increase Tubes per Step, Increase Surface Offset, Turn On Time Clip
    D. Increase Tubes per Step, Turn On Stroke Time, Turn Off Time Clip

15. Which file naming structure below is most suitable for use as an animated texture for sprite particles?

    A. sprite-001.png
    B. sprite.001.png
    C. sprite_001.png
    D. sprite.png.001

16. The amount of particles emitted from an emitter depends on its Rate value. How does MAYA measure its particle's Rate value?

    A. Particles emitted per cycle
    B. Particles emitted per frame
    C. Particles emitted per second
    D. Particles emitted per distance

Continued .....

17. Which dynamic field below is suitable to create a directional movement force?

    A. Drag field
    B. Radial field
    C. Uniform field
    D. Air field

18. Alisson had just created a *n*Hair dynamic setup from a polygonal surface. He realized that there were 3 new curves created together with his hair follicles. Which curves below are **NOT** parts of the *n*Hair dynamic system?

    A. Start Curve
    B. Contact Curve
    C. Rest Curve
    D. Current Curve

19. Fabinho is adding a new water droplet effect using *nParticle* into an existing *nCloth* shirt simulation. He wanted the water droplet to collide and trickle down along the shirt. However, he could not get the water droplet to interact with the shirt. What must he do to solve this problem?

    A. Ensure that the *'Collision Layer'* for both *nDynamic* object is the same
    B. Ensure that the new *nParticle* is assigned to the *nCloth* nucleus
    C. Ensure that the new *nParticle* 'Collision Tolerance' is set to high
    D. Ensure that the *nCloth* is a Passive Collider object

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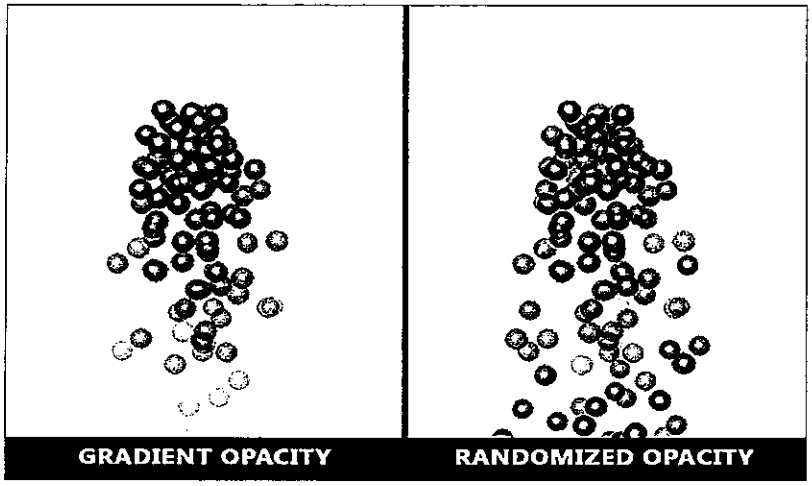

Image 04

20. *Image 04* above shows a simple *nParticle* objects emitted from the same emitter with a black to white ramp assigned to their opacity channel. By default, the *nParticles* will have an opacity effect similar to *'Gradient Opacity'*. What can you do to achieve the *'Randomized Opacity'* effect instead?

I. Assign the Opacity Scale Input to Randomized ID
II. Assign a randomizing runtime expression onto the opacity channel
III. Increase the Lifespan Random attribute
IV. Create a black and white stripe pattern on the opacity ramp channel with Opacity Scale Input set to Age.

A. I only
B. I and II
C. I, II and III
D. All of the above

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PART TWO: ESSAY QUESTIONS
Answer THREE of the following Four Questions. Give DIRECT answers.

Question 1

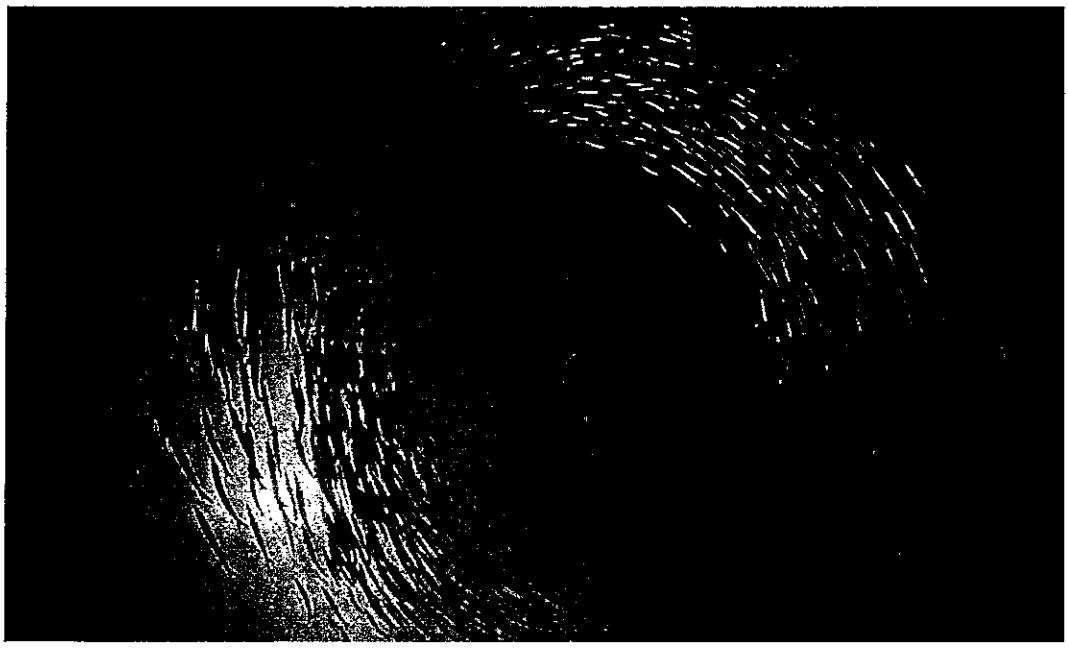

Image 05

I. The image above shows a school of fish with different sizes swimming in a circle around a diver. Explain **BRIEFLY** how to achieve this effect using the particle systems in Maya?

(16 marks)

II. Explain **BRIEFLY** what a 2D fluid container and a 3D fluid container. How would their differences affect a fluid effects production process?

(4 marks)

Continued .....

Question 2

Image 06

I. *Image 06* above is a slow-mo shot of a character's face being punched. The face deforms and reacts when the punch hits him but returns back to its original shape soon after. Please explain in detail how this effect can be achieved. INDICATE and EXPLAIN the major steps needed to accomplish the action using any suitable Maya effect systems.

(16 marks)

II. In creating smoke effects, explain the difference between using a sprite particle type as compared to a cloud particle type?

(*4 marks*)

Question 3

I. List down and explain the **MANY** differences between MAYA Rigid Body and the BULLET dynamic system?

(*10 marks*)

II. What is a Rigid Body Set, and what are the numerous benefits of using them during a BULLET simulation process?

(*10 marks*)

Continued .....

Question 4

Image 07

I. *Image 07* above shows a guy splashing in a pool of water. The water movement is realistic and reacts accordingly to the character's animation. Suggest the best effect system to use to achieve this effect. Give a rough STEP-BY-STEP explanation on how to achieve this effect using the system suggested.

(16 marks)

II. What is MASTER VOXEL SIZE in liquid simulation? How would adjusting this value affect the simulation results?

(*4 marks*)

**Please check, re-check and triple-check your answers until the exam ends*

End of Paper